



Docket No.: J4-K10

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of: Moon-Soo Yoo )  
Serial Number : 09/735,770 )  
Filed: December 13, 2000 )  
For: Apparatus for Changing )  
the Speed of Bicycles \_\_\_\_\_ )  
Examiner: Parekh, Ankur  
Group Art Unit: 3681  
South Pasadena, California  
August 6, 2002

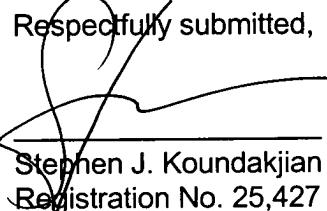
**REWRITTEN CLAIMS**

Honorable Commissioner of  
Patents and Trademarks  
Washington, D.C. 20231

Sir:

In response to the Office Action of March 6, 2002 in respect to the above-identified Application, the Claims have been rewritten in marked-up and clean form, both of which are attached hereto.

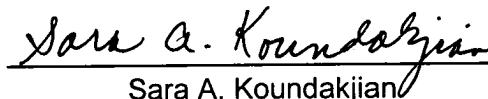
Respectfully submitted,

  
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**CERTIFICATION UNDER 37 C.F.R. 1.10**

I hereby certify that the accompanying REWRITTEN CLAIMS is being deposited with the United States Postal Service on the date indicated below, in an envelope designated as "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10, Mailing Label Number: ET847117180US, addressed to the Assistant Commissioner for Patents, Washington, DC 20231.

 August 6, 2002  
Sara A. Koundakjian (date)



## CLAIMS

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## What is claimed is:

1. (Amended) An apparatus for changing the speed of a [bicycles] bicycle having a rear driving wheel, the apparatus comprising:

a driven sprocket for receiving the driving force of a driving sprocket;

a speed controlling portion, [that is] comprising:

10 a carrier [that is] fixed to one side of the driven sprocket, [and] a plurality of planetary gears [is installed] within said carrier, each of said planetary gears having ratchet-teeth along the inner circumference thereof,

at least two sun gears [that are engaging] , each having ratchet-teeth along its inner circumference, engageable with each [step] of the planetary gears[ and ratchet-teeth is formed along inner circumference];

15 a ring gear [that is engaging] engageable with the [other side] outer circumferences of the planetary gears;

an output portion, [that is] comprising:

a hub shell for transferring the driving force to [a] the rear wheel of the bicycle by means of the carrier and the ring gear;

20 a clutch means, mounted between the carrier and hub shell and the ring gear and the hub shell [that is mediating] to selectively mediate the driving force [selectively with being mounted between the carrier and the hub shell, and the ring gear and the hub shell]; and

a speed-change controlling portion, [that is] comprising:

a hub shaft having a pawl-positioning portion;

25 at least two [set] sets of pawls [which are engaging or releasing with] engageable with and releasable from the ratchet-teeth of the [at least two] sun gears;

a pawl-controlling ring [that is] for controlling the position of the [at least two set of] pawls;

30 a transforming disk having a groove along its outer circumference, and [which] a hooking portion [is formed] on [the] said outer circumference, said hooking portion [in order] adapted to transform the position of the pawl-controlling ring [via] through a mediating portion;

a spring [that is] for restoring the position of the transforming disk to its original position; and

a spacing portion enabling the [transforming disk] mediating portion to rotate freely.

5 2. (Amended) The apparatus [for changing speed of bicycles] of [the] claim 1, wherein on the inner surface of the pawl-controlling ring, grooves are [formed] positioned symmetrically with respect to the center point.

10 3. (Amended) The apparatus [for changing speed of bicycles] of [the] claim 2, wherein the grooves of the pawl-controlling ring are not [formed] positioned [with] at a uniform [the same] [angle] angular interval with respect to the center point of the pawl-controlling ring.

15 4. (Amended) The apparatus [for changing speed of bicycles] of [the] claim 2, wherein the grooves [are composed of] comprise a [couple] pair of sloping [groove] grooves and a [couple] pair of angular [groove alternatively] grooves, the sloping groves alternating with the respective angular grooves.

5. (Amended) The apparatus [for changing speed of bicycles] of [the] claim 1, wherein the pawls are [installed] positioned in the pawl-positioning portion of the hub shaft [with the same] at a uniform angular interval.

20 6. (Amended) The apparatus [for changing speed of bicycles] of [the] claim 1, wherein each of the pawls [are comprising] comprises:

a sag portion [that is positioning] positioned inside of the pawl-controlling ring; and  
a stopper portion [that is engaging or releasing] engageable with and releasable from the ratchet-teeth [which is formed] at the inner circumference of the sun gear.

25 7. (Amended) The apparatus [for changing speed of bicycles] of [the] claim 6, wherein [the] those pawls[, which are positioning] positioned relatively far from the pawl-controlling ring[, are] further [comprising] comprise an extended portion that is thinner than the pawl [body] bodies [, whereby preventing the pawl from engaging other elements].

8. (Amended) The apparatus [for changing speed of bicycles] of [the] claim 1, wherein the mediating portion [is comprising] comprises:

30 a splined groove [that is formed] on one side of the pawl-controlling ring;  
a connecting portion [that is] having a coupling groove, said connecting portion engaging [with] the splined groove [and a coupling groove is formed therein]; and  
a pork ring [that is installed] in the coupling groove, mediating the rotational force [with] by [being] engaging [with] a splined portion [formed in] of the transforming disk.

9. (Amended) The apparatus [for changing speed of bicycles] of [the] claim 1, wherein the spacing portion [is comprising] comprises:

a sustaining portion sustaining a bear ring, which is mounted between the carrier and the sustaining portion;

5 a fixed disk that is fixed to the hub shaft; and

a plurality of spacer pins that [is] are fixed to the fixed disk and [contacting] in contact with the sustaining portion through an arc groove [formed] in the transforming disk.

10. (Amended) The apparatus [for changing speed of bicycles] of [the] claim 9, wherein the sustaining portion is rotatable, and a [through] passage hole is [formed] provided

10 therein.

11. (Amended) The apparatus [for changing speed of bicycles] of [the] claim 1, [in case of] comprising more than two set of pawls, a plurality of [the] pawl-controlling [ring is installed] rings provided between each set of pawls.

12. (Amended) The apparatus [for changing speed of bicycles] of [the] claim 1, wherein the clutch means [is comprising] comprises:

a clutch ring [that is] having a group of pins [is formed thereof] positioned therein; and a sloping portion [that is formed] at the outer circumference of the carrier and the ring gear.

13. (Amended) The apparatus [for changing speed of bicycles] of [the] claim 1, wherein the clutch means [is comprising] comprises:

a first pawl [installed] in the space between the planetary gears; and

a ring gear portion [formed] at the inner circumference of the hub shell.

14. (Amended) The apparatus [for changing speed of bicycles] of [the] claim 1, wherein the clutch means [is comprising] comprises:

25 a second pawl installed in the space between the planetary gears;

a ring gear outside the second pawl [engaged with] simultaneously engaging the planetary gears and the second pawl [at the same time installed outside of the second pawl]; and

a third pawl [installed] between the ring gear and the hub shell.

30 15. (Amended) The apparatus [for changing speed of bicycles] of [the] claim 1, wherein the mediating portion [is comprising] comprises:

a pin fixed on one side of the pawl-controlling ring, [and the] said pin [is] connected to the transforming disk through a disk [installed] positioned between the pawl-controlling ring and the transforming disk.